

piezoresistive shear-stress sensor for measuring the shear stress distribution between socket of above-knee (AK) prostheses and the soft tissue of amputee's stump.

5 The second purpose of the invention is to disclose the preparation processes, therein make anisotropic wet etching of bulk silicon in KOH solution and a square flange.

#### *Brief description of the drawings*

The invention will now be described by way of example with reference to the accompanying Tables and Figures in which:

Figures 1 shows the effective stress distribution while the diaphragm is loaded with 640 Kpa Normal Pressure, analyzed by FEM.

The distribution from red to blue stands for the effective stress from maximum to minimum.

Figures 2 (a) -(c) shows the 3-D structure of the sensor

Figures 2 (a) Top Front View;

Figures 2 (b) Section of the etched cavity of the Shear-Stress sensor;

Figures 2 (c) Back of the cavity.

Figures 3 (a) -(h) indicates the steps of the preparation process.

Figures 3 (a) polish and implantation

Figures 3 (b) sputter to deposit  $\text{Si}_3\text{N}_4$

Figures 3 (c) etching

Figures 3 (d) sputter to deposit  $\text{SiO}_2$

Figures 3 (e) Connect the component

*JM  
11/7/05*

**The claim of this patent contains at least one drawing executed in color.**